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A new species of *Malthinus* Latreille, 1806 of the *M. biguttatus* group from the Eastern Caucasus, with description of the female of *M. kaszabi* Wittmer, 1974 (Coleoptera: Cantharidae)

Новый вид *Malthinus* Latreille, 1806 группы *M. biguttatus* с Восточного Кавказа, с описанием самки *M. kaszabi* Wittmer, 1974 (Coleoptera: Cantharidae)

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KEY WORDS: Coleoptera, Cantharidae, Malthininae, Malthinus, new species, Caucasus, Palaearctic region.
КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Cantharidae, Malthininae, Malthinus, новый вид, Кавказ, Палеарктика.

ABSTRACT. A new species of malthinine soldier beetles, *Malthinus* (s.str.) *melniki* **sp.n.**, is described from Dagestan. The new species belongs to the *M. biguttatus* group of species, three other members of which, *M. biguttatus* (Linnaeus, 1758), *M. caucasicus* Wittmer, 1974 and *M. kaszabi* Wittmer, 1974, are also illustrated by colour photographs of habitus, as well as of their male and female genitalia. A female of *M. kaszabi* and external female copulatory organs of *M. biguttatus* are described and illustrated for the first time.

РЕЗЮМЕ. Новый вид мальтинин из семейства жуков-мягкотелок, *Malthinus* (s.str.) *melniki* **sp.n.**, описывается из Дагестана. Новый вид принадлежит группе видов *M. biguttatus*, ещё три вида которой, *M. biguttatus* (Linnaeus, 1758), *M. caucasicus* Wittmer, 1974 и *M. kaszabi* Wittmer, 1974, проиллюстрированы цветными фотографиями габитуса, а также мужских и женских гениталий. Впервые приводятся описание и иллюстрации самки *M. kaszabi* и наружных женских половых органов *M. biguttatus.*

Introduction

The soldier beetle genus *Malthinus* Latreille, 1806, widely distributed in the Holarctic realm, and also occurring in the Neotropics and the Oriental region, is one of the most species-rich in the family. It accounts for over 350 species, the greater part of which, about 300, are registered in the Palaearctic region [Delkeskamp, 1977; Kazantsev, Brancucci, 2007].

In Russia there are ten species of *Malthinus* [Kazantsev, 2011], some of which may be distinguished from the rest by the mostly black coloration and widened and rounded anteriorly pronotum; unlike most of the remaining ones they never have longitudinal rows of punctures on the elytra and their hind tibiae are never modified. These species include *M. biguttatus* (Linnaeus, 1758) and *M. caucasicus* Wittmer, 1974, the former widely distributed in the European part of the country, the latter confined to the Caucasus [Kazantsev, 2011, 2024]. The rediscovery in the adjacent Georgia of the rare *M. kaszabi* Wittmer, 1974, which had been known just by two specimens, prompted a re-analysis of this group of species, especially of the Caucasian specimens belonging to it. The re-analysis has demonstrated that the individuals from Derbent (Dagestan), preliminarily attributed to *M. caucasicus*, belong in fact to a new species. The description of the new taxon is presented below, as well as the description of the female of *M. kaszabi*, which previously has not been known. Males and females of *M. biguttatus* and *M. caucasicus* are also illustrated.

Material and methods

The studied beetles were glued on cardboard plates. Before the examination, they were relaxed in water, then their detached abdomens were kept for several hours in 10% KOH at room temperature. The KOH treated aedeagi/female genitalia and

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terminal abdominal segments were then placed in microvials with glycerin for photographing.

MSP-1 zoom stereoscopic dissecting microscope with 8–80 times magnification range was used for examination of diagnostic characters. Photographs were taken with a Canon EOS 6D camera and Canon MP-E 65 mm lens and processed with Zerene Stacker and Adobe Photoshop software.

The terminology of the female copulatory organs is given after Brancucci [1980]. The body length was measured from anterior part of the head to apices of folded wings.

The following acronyms are used the text: ICM — Insect Center, Moscow; MB — Museum Budapest; NHMB — Naturhistorisches Museum, Basel; ZMMU — Zoological Museum of Moscow University, Moscow.

Taxonomy

Family Cantharidae Imhoff, 1856 (1815)
Subfamily Malthininae Kiesenwetter, 1852
Tribe Malthininae Kiesenwetter, 1852
Malthinus Latreille, 1806
Subgenus *Malthinus* Latreille, 1806

Malthinus Latreille, 1806: 261.

Type species *Cantharis flaveola* Herbst, 1786, subsequent designation by Delkeskamp [1977].

= *Apteromalthinus* Escalera, 1913: 322, type species *Apteromalthinus pithanoides* Escalera, 1913 (by monotypy).

= *Malachidius* Motschulsky, 1860: 62, type species *Malthinus conspicuus* Kiesenwetter, 1852 (original designation).

= *Progeutes* Abeille de Perrin, 1894: 92, type species *Malthinus longipennis* P.H. Lucas, 1846 (subsequent designation by Delkeskamp [1977]).

= *Ymnis* Des Gozis, 1886: 23, type species *Malthinus flaveolus* Herbst, 1786 (original designation).

Malthinus (s.str.) *melniki* Kazantsev, **sp.n.**
Figs 1, 2, 11, 12, 20–22.

MATERIAL. Holotype, ♂, 'Dagestan, Derbent, 42°03'06" N 48°16'27" E (180 m) — 42°02'51" N 48°15'36" E (320 m), 17.V.2022, I. Melnik leg.' (ICM); paratypes: 3 ♂♂ and 1 ♀, same label (ICM).

DESCRIPTION. **Male.** Brown to dark brown to black; head in front of eyes, basal palpomeres, pro- and mesosterna, sides of metasternum whitish yellow; antennomeres 1 and partly 2, pronotal hind angles, legs, except partly middle and hind femurs, tibiae, except basally, and hind coxae proximally, testaceous; elytral apices sulphur yellow (Fig 1).

Head transverse, without eyes slightly wider than pronotum. Eyes small, spherical, interocular distance ca 2.3 times greater than eye diameter in dorsal view. Vertex in rough dense punctures. Ultimate maxillary and labial palpomeres narrow, noticeably longer than wide. Antennae filiform, attaining to apices of folded wings; antennomere 3 ca 1.25 times longer than pedicel (antennomere 2) and ca 1.3 times shorter than antennomere 4; antennal pubescence relatively short and sub-erect (Fig. 1).

Figs 1–2. *Malthinus melniki* **sp.n.**, general view: 1 — male, holotype; 2 — female, paratype.
Рис. 1–2. *Malthinus melniki* **sp.n.**, общий вид: 1 — самец, голотип; 2 — самка, паратип.

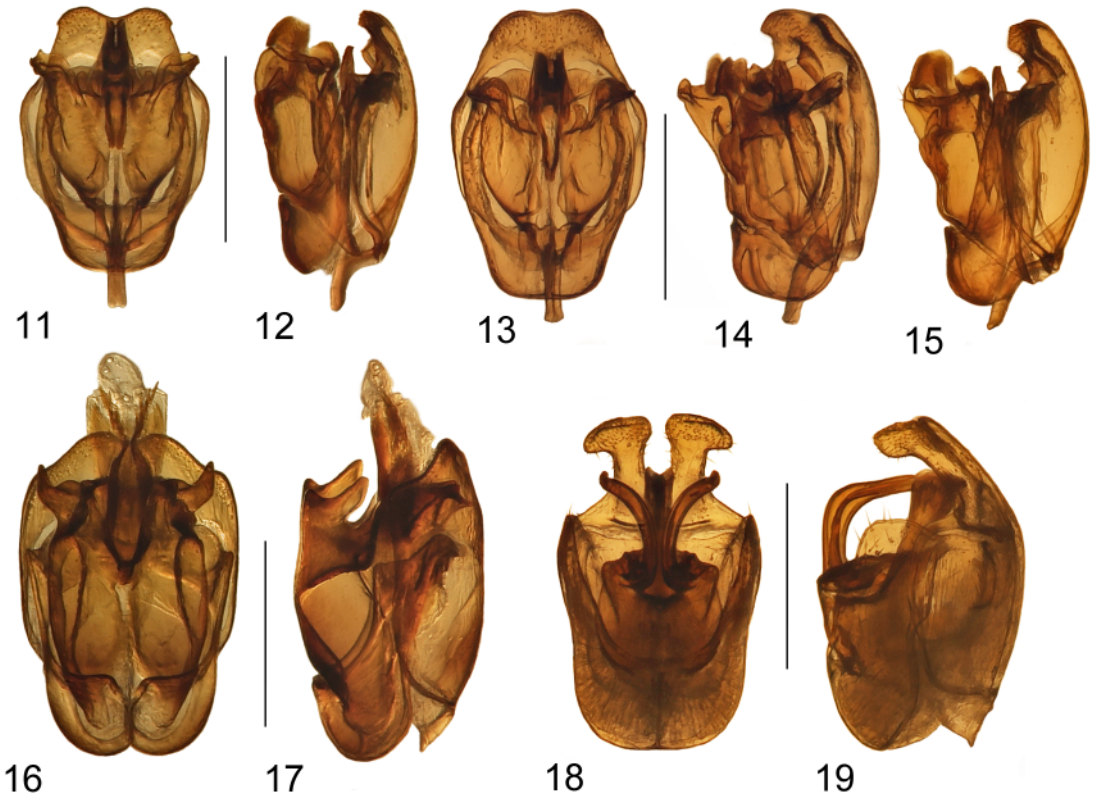
Pronotum transverse, ca 1.1 times wider than long, widest in anterior third, roundly narrowed anteriorly, noticeably concave before acute hind angles, convex at anterior margin and indistinctly bisinuate posteriorly; in rough dense punctation (Fig. 1).

Elytra elongate, ca 2.7 times longer than wide at humeri, parallel-sided, independently narrowed and rounded at apex, leaving ca posterior twelfth of folded wings uncovered; longitudinal ribs indistinct, more noticeable near suture; elytral pubescence uniform, short and sub-erect. Scutellum relatively small, narrowing distally, with noticeably concave at sides, slightly medially emarginate at apex (Fig. 1).

Legs long and slender; femurs subequal in length to tibiae, straight and narrow; posterior trochanter elongate, elliptical (Fig. 1).

Figs 3–6. *Malthinus*, general view: 3 — *M. biguttatus*; 4 — *M. caucasicus*; 5, 6 — *M. kaszabi*; 3–5 — males; 6 — female (3, 4 — after Kazantsev, 2022).
Рис. 3–6. *Malthinus*, общий вид: 3 — *M. biguttatus*; 4 — *M. caucasicus*; 5, 6 — *M. kaszabi*; 3–5 — самцы; 6 — самка (3, 4 — по: Kazantsev, 2022).

Figs 7–10. *Malthinus*, males, ultimate abdominal segments: 7 — *M. biguttatus*; 8, 9 — *M. caucasicus*; 10 — *M. kaszabi*; 7, 9 — laterally; 8 — dorsolaterally; 10 — ventrolaterally; 9 — dorsally. Scale bars — 0.5 mm.
Рис. 7–10. *Malthinus*, самцы, вершинные сегменты брюшка: 7 — *M. biguttatus*; 8, 9 — *M. caucasicus*; 10 — *M. kaszabi*; 7, 9 — сбоку; 8 — сверху и сбоку; 10 — снизу и сбоку; 9 — сверху. Масштабные линейки — 0,5 мм.



Figs 11–19. *Malthinus*, males, aedeagus: 11, 12 — *M. melniki* **sp.n.**; 13–15 — *M. caucasicus*; 16, 17 — *M. biguttatus*; 18, 19 — *M. kaszabi*; 11, 13, 16, 18 — dorsally; 12, 15, 17, 19 — laterally; 14 — dorsolaterally. Scale bars — 0.5 mm.
Рис. 11–19. *Malthinus*, самцы, эдеагус: 11, 12 — *M. melniki* **sp.n.**; 13–15 — *M. caucasicus*; 16, 17 — *M. biguttatus*; 18, 19 — *M. kaszabi*; 11, 13, 16, 18 — сверху; 12, 15, 17, 19 — сбоку; 14 — сверху и сбоку. Масштабные линейки — 0,5 мм.

Ultimate sternite elongate, abruptly bent before apical third and deeply incised distally, with tips bent outwards; ultimate tergite transverse, outwardly bent distally in lateral view; both similar to those of *M. caucasicus* (Figs 8, 9).

Aedeagus elongate, distinctly widened in the middle third, with conspicuously emarginate distally dorsal plate, bearing a pair of minute teeth laterally, broadly explanate parameres, reaching beyond the contour of dorsal plate and dentate distally and elongate median piece, almost attaining to the distal margin of dorsal plate (Figs 11, 12).

Body length: 5.2–5.3 mm; width (at humeri): 1.0–1.05 mm.

FEMALE. Similar to male, but antennae shorter, attaining only to elytral three fifths. Ultimate ventrite transverse, with W-shaped emargination medially, distal part of coxites long and narrow, in lateral view with blunt triangular ventral process (Figs 2, 20–22). Body length: 5.6 mm; width (at humeri): 1.1 mm.

ETYMOLOGY. The new species is named after the collector of the type series, Cleridae specialist Mr. Igor Melnik (Moscow).

DIAGNOSIS. *Malthinus melniki* **sp.n.** externally resembles *M. biguttatus*, differing in the distinctly differently structured male ultimate ventrite, aedeagus and female genitalia (Figs 11, 12, 20–22), and is separable from *M. caucasicus* Wittmer, 1974, with a similar structure of the male ultimate ventrite, aedeagus and female genitalia, by the the more emarginate distally dorsal plate of the aedeagus, bearing a pair of minute teeth laterally, broadly explanate parameres, reaching beyond the contour of the dorsal plate and more dentate distally, longer median piece, almost as long as the dorsal plate (Figs 11, 12) vs shallowly emarginate distally dorsal plate, not reaching beyond the contour of the dorsal plate and less dentate distally parameres, and shorter median piece, attaining only to the middle of the apical constriction of the dorsal plate (Figs 13–15).

REMARKS. The anterior pronotal margin varies in *M. melniki* **sp.n.** from slightly to strongly convex.

Malthinus kaszabi Wittmer, 1974
Figs 5, 6, 10, 18, 19, 28, 29.

Malthinus kaszabi Wittmer, 1974: 418.

MATERIAL. ♂, ‘Georgia, Adjara, S Bobokvati Station, 27.V.1928, D. Romashov leg.’ (ZMMU); 2 ♂♂, ‘Georgia, env. Bakuriani, S Borzhomi, 1–2 km W Sadgeri, 1050–1150 m, 41.80°N 43.41°E, 16.VII.2024, S. Kazantsev leg.’; ♂, ’Georgia, env. Bakuriani, env. Patara Mitarbi, 1350–1440 m, 41.76°N 43.57°E, 17–19.VII.2024, S. Kazantsev leg.’; 2 ♂♂ and ♀, ‘Georgia, env. Bakuriani, 2–3 km ESE Patara Mitarbi, 1500–1770 m, 41.77°N 43.59°E, 19.VII.2024, S. Kazantsev leg.’ (ICM).

DESCRIPTION. **Female.** Similar to male, but antennae shorter, attaining only to elytral three fifths. Ultimate ventrite transverse, with elongate roundish emargination medially,

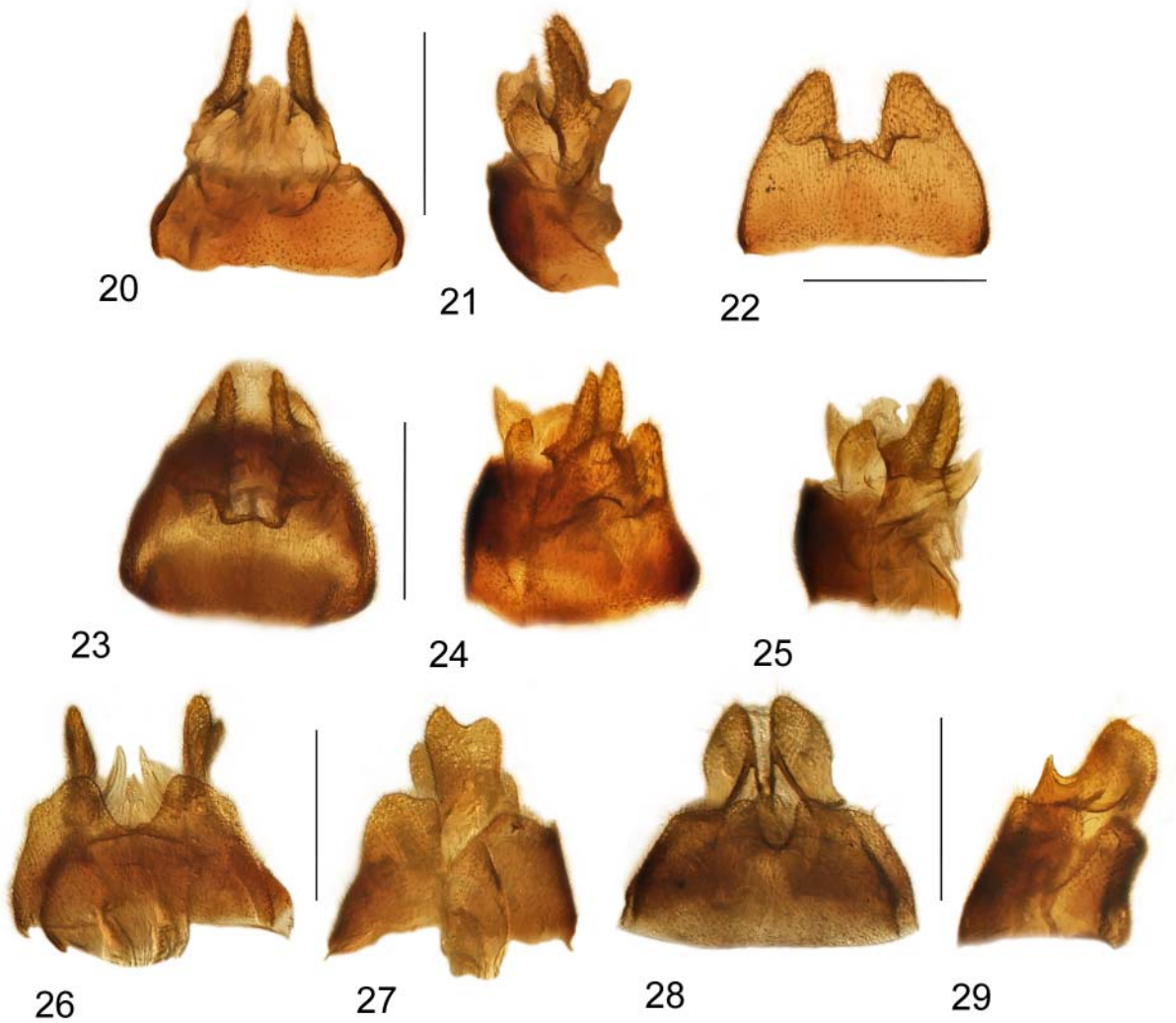
distal part of coxites broad and obliquely truncate at apex, in lateral view with acute long ventral process (Figs 6, 28–29). Body length: 5.8 mm; width (at humeri): 1.1 mm.

REMARKS. As in *M. melniki* **sp.n.**, the anterior pronotal margin appears to be variable in *M. kaszabi*, from slightly bisinuate and more or less straight (Fig. 5) to conspicuously convex (Fig. 6).

Malthinus kaszabi has until recently been known only by two male specimens, the Holotype labelled 'Caucasus, Meskhisches Gebirge, leg. Leder, Reitter' (deposited in MB) and a paratype from 'Turkei, Anatolien, Prov. Trabzon, Macka, Hamsikoy, 1200 m, 14-15.VI. 1972' (deposited in NHMB) [Wittmer, 1974]. A third specimen, also a male, from a location near Batumi, was found in the ZMMU collection [Kazantsev, 2024]. It was collected back in 1928 by a Moscow amateur entomologist Dmitry Romashov, future prominent geneticist. Last summer, however, after a 50 year search, further material on this enigmatic species was finally acquired. Six specimens, including one female, were collected during the 2024 expedition to the Borzhomi and Bakuriani region in Georgia. They were taken by beating and sweeping foliage in damp habitats on forest roads.

Discussion

Three of the illustrated above species, *M. biguttatus*, *M. caucasicus* и *M. kaszabi*, despite their external similarity (Figs 3–6), are very different in the structure of their terminal abdominal segments, aedeagi and female



Figs 20–29. *Malthinus*, female terminalia: 20–22 — *M. melniki* **sp.n.**; 23–25 — *M. caucasicus*; 26, 27 — *M. biguttatus*; 28, 29 — *M. kaszabi*; 22 — ultimate ventrite; 25 — with ultimate ventrite removed; 20, 22, 23, 26, 28 — ventrally; 21, 24, 25, 27, 29 — laterally. Scale bars — 0.5 mm (23–25 — after Kazantsev, 2024).

Рис. 20–29. *Malthinus*, самки, вершина брюшка: 20–22 — *M. melniki* **sp.n.**; 23–25 — *M. caucasicus*; 26, 27 — *M. biguttatus*; 28, 29 — *M. kaszabi*; 22 — вершинный вентрит; 25 — с удалённым вершинным вентритом; 20, 22, 23, 26, 28 — снизу; 21, 24, 25, 27, 29 — сбоку. Масштабные линейки — 0,5 мм (23–25 — по: Kazantsev, 2024).

terminalia (cf Figs 7–10, 13–19, 23–29). It suggests they had enjoyed independent evolution for quite a long time, also keeping in mind that the Malthininae are among the basic lineages in this family of Coleopterans dating back to at least 100 myo and that their fossil congeners have already been found in Baltic amber [Motyka et al., 2023; Kuśka, Kania, 2010; Fanti, Damgaard, 2018]. Unlike these three, *M. melniki* **sp.n.** does not differ considerably from *M. caucasicus*, being fairly similar in the structure of terminal abdominal segments and female terminalia (Figs 20–25). The only characters that separate the two taxa are those of their aedeagi (11–15). Here we are apparently witnessing a relatively recent case of speciation, which actually requires further investigation into morphology of these two taxa from areas between Derbent, in the Eastern Caucasus, where *M. melniki* **sp.n.** was discovered, and the rest of the Caucasus, the distribution area of *M. caucasicus*.

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